INVESTIGATOR'S ANNUAL REPORT

National Park Service

All or some of the information provided may be available to the public

Reporting Year: 1993	**Park:** Shenandoah NP
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Permit#:
SHEN1993AGPX

Park-assigned Study Id. #:
unknown

Project Title:
The Role of Soil Water in Stormflow Generation

Permit Start Date: Jan 01, 1998	**Permit Expiration Date** Jan 01, 1998
Study Start Date: Jan 01, 1992	**Study End Date** Jan 01, 1993

Study Status:
Completed

Activity Type:
Other

Subject/Discipline:
Water / Hydrology

Objectives:
To estimate the contribution of pre-event water to stormflow in a forested headwater catchment in Shenandoah National Park using natural tracers and a three-component hydrograph separation model.

Findings and Status:
We inferred that transient saturated zone would consist of nearly all pre-event soil. Based on field observation, we believe that rates of downslope flow of displaced pre-event soil water (along the saturated zone) are supplemented during large storm events by a threshold type expansion of the source area onto the hillslopes. A Monte Carlo error analysis of the hydrograph separations supported the interpretation for the June storm that pre-event soil water dominated peak flow (=0.12), but showed considerable uncertainty even under the relatively good conditions (i.e., distinct source component chemical and isotopic composition); the uncertainty range for the peak flow soil water contribution was 48% to 88% (at a confidence level of 68%). Analysis of the November storm indicated greater uncertainty and more poorly identifiable soil water component. This study provides evidence that mobilization of pre-event soil water may dominate peak stormflow in steep forested headwater catchments, and illustrates that quantitative error analysis are advisable for hydrograph separation studies.

For this study, were one or more specimens collected and removed from the park but not destroyed during analyses?
No

Funding provided this reporting year by NPS: 15000	**Funding provided this reporting year by other sources:** 0

Fill out the following ONLY IF the National Park Service supported this project in this reporting year by providing money to a university or college

Full name of college or university:	**Annual funding provided by NPS to university or college this reporting year:**

n/a	0